

# Xiuwei Xu

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## Education

### Department of Automation, Tsinghua University

PhD in Control Science and Engineering

Advisor: Prof. Jiwen Lu

Beijing, China

2021-

### Department of Automation, Tsinghua University

B.S. in Automation

Beijing, China

2017-2021

## Experience

### BOSCH China

Intern in Autonomous Driving Department

Engineer topic: multi-task scene understanding, semi-supervised object detection.

Shanghai, China

2023

### Cambricon

Intern in Intelligent Processor Research Center

Engineer topic: CNN acceleration and deployment on microserver with C-based language.

Beijing, China

2020

## Research Interests

**My research interest is 3D vision and robotics.** In particular, I am interested in 3D scene understanding and its application in embodied tasks like navigation and manipulation. I believe embodied intelligence will reshape the society and benefit our lives. My long-term goal is to construct general embodied agents with the ability to perceive, plan and act in 3D space.

## Publications

\* Equal contribution, † Project leader.

### First-Authored Top Conference/Journal

- [1] **Xiuwei Xu**, Huangxing Chen, Linqing Zhao, Ziwei Wang, Jie Zhou and Jiwen Lu  
**EmbodiedSAM: Online Segment Any 3D Thing in Real Time**  
The Thirteenth International Conference on Learning Representations (ICLR, **Oral**), 2025
- [2] Hang Yin\*, **Xiuwei Xu**\*†, Zhenyu Wu, Jie Zhou, Jiwen Lu  
**SG-Nav: Online 3D Scene Graph Prompting for LLM-based Zero-shot Object Navigation**  
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2024
- [3] **Xiuwei Xu**\*, Zhihao Sun\*, Ziwei Wang, Hongmin Liu, Jie Zhou, Jiwen Lu  
**3D Small Object Detection with Dynamic Spatial Pruning**  
European Conference on Computer Vision (ECCV), 2024
- [4] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu  
**Back to Reality: Learning Data-Efficient 3D Object Detector with Shape Guidance**  
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2024
- [5] **Xiuwei Xu**\*, Chong Xia\*, Ziwei Wang, Linqing Zhao, Yueqi Duan, Jie Zhou, Jiwen Lu  
**Memory-based Adapters for Online 3D Scene Perception**  
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [6] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu  
**Binarizing Sparse Convolutional Networks for Efficient Point Cloud Analysis**  
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023

- [7] **Xiuwei Xu**, Yifan Wang, Yu Zheng, Yongming Rao, Jie Zhou, Jiwen Lu  
**Back to Reality: Weakly-supervised 3D Object Detection with Shape-guided Label Enhancement**  
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022

### Peer-Reviewed Conference Publications

- [8] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu  
**Q-VLM: Post-training Quantization for Large Vision-Language Models**  
Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS), 2024
- [9] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu  
**Towards Accurate Post-training Quantization for Diffusion Models**  
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, **Highlight**), 2024
- [10] Linqing Zhao, **Xiuwei Xu**, Ziwei Wang, Yunpeng Zhang, Borui Zhang, Wenzhao Zheng, Dalong Du, Jie Zhou and Jiwen Lu  
**LowRankOcc: Tensor Decomposition and Low-Rank Recovery for Vision-based 3D Semantic Occupancy Prediction**  
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [11] Yinan Liang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu  
**MCUFormer: Deploying Vision Transformers on Microcontrollers with Limited Memory**  
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023

### Peer-Reviewed Journal Publications

- [12] Ziwei Wang, Changyuan Wang, **Xiuwei Xu**, Jie Zhou and Jiwen Lu  
**Quantformer: Learning Extremely Low-precision Vision Transformers**  
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2023
- [13] Yu Zheng, **Xiuwei Xu**, Jie Zhou and Jiwen Lu  
**PointRas: Uncertainty-Aware Multi-Resolution Learning for Point Cloud Segmentation**  
IEEE Transactions on Image Processing (T-IP), 2022

### Honors and Awards

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|---|------|
| ○ NSFC Youth Student Research Grant (PhD)                         | 2024 |
| ○ Chinese National Scholarship                                    | 2024 |
| ○ Outstanding Graduate of Beijing                                 | 2021 |
| ○ Innovation Award of Science and Technology, Tsinghua University | 2020 |
| ○ Innovation Award of Science and Technology, Tsinghua University | 2019 |

### Teaching Experience

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|---|-----------------------------|
| <b>Department of Automation, Tsinghua University</b><br>Teaching assistant for Computer Vision                          | Beijing, China<br>2024-2025 |
| <b>Department of Automation, Tsinghua University</b><br>Teaching assistant for Pattern Recognition and Machine Learning | Beijing, China<br>2022-2023 |
| <b>Department of Automation, Tsinghua University</b><br>Teaching assistant for Numerical Analysis                       | Beijing, China<br>2021      |

### Academic Services

#### Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2025)

- Neural Information Processing Systems (NeurIPS 2024-2025)
- IEEE/CVF International Conference on Computer Vision (ICCV 2023, 2025)
- European Conference on Computer Vision (ECCV 2024)
- International Conference on Machine Learning (ICML 2025)
- International Conference on Representation Learning (ICLR 2025)

### **Journal Reviewer**

- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (T-IP)
- IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)
- IEEE Transactions on Multimedia (T-MM)
- IEEE Transactions on Intelligent Transportation Systems (T-ITS)